restricted to resemblances assumed for the purpose of attracting attention; resemblances for the purpose of concealment being denoted by the terms protective and aggressive resemblance. He then proceeds to inquire whether any of such resemblances can be rightly termed conscious, concluding that the only instance which affords anything like proof of consciousness is one narrated by Mr. E. Thompson concerning the actions of a fox. But even if this be a true instance, the fox is such an abnormally clever animal that the case does not affect other supposed examples; and it is concluded that "there are good grounds for opposing the suggestion that active mimicry is of any general occurrence in the animal kingdom." Prof. E. B. Poulton continues the discussion in the form of notes, in which he gives a general support to the views of Mr. Marshall. Incidentally he mentions that the posture usually given to the leaf-butterfly (Callima) is incorrect. Mr. Distant adds a few remarks in defence of his own views, stating that the questions at issue are largely matters of opinion.

WE have received the first part of a new work by Prof. Der Vries, of Amsterdam, entitled "Die Mutations Theorie." It deals with the origin of new species; and these the author considers to arise solely as the result of sudden sporting, or of discontinuous variation. He does not regard the ordinary variation usually to be observed amongst the individuals of any given race as contributing towards the evolution of new species, but looks upon them as the transient and easily reversible expression of altered circumstances of life. The latter part of the book is occupied with an account of his observations on the "mutations" exhibited by *Œnothera Lamarckiana*, and he claims to have secured a number of discontinuously produced forms which retain their character in successive generations, and which show no tendency towards reversal, nor to the production of forms intermediate between themselves and the parent stock. Even if one does not feel inclined to accept all the author's conclusions, and even if lurking doubts as to the actual purity of the original strain of his Œnothera obtrude themselves on the mind of the reader, the book is worth a perusal for the sake of the lucid manner with which the arguments and facts are brought forward, and (sometimes) constrained to give support to the views therein advocated. It would be, however, premature to discuss the theory as a whole until the completion of the book enables one to form a mature estimate of its real value.

THE November *Journal* of the Royal Horticultural Society provides students of botany and others interested in problems of evolution with plenty of material for thought. Among the subjects dealt with in papers are the evolution of plants illustrated by the cultivated nature of gardens, by Mr. R. I. Lynch; problems of heredity as a subject for horticultural investigation, by Mr. W. Bateson, F.R.S.; aquatic plants, by Prof. G. S. Boulger; protoplasm, the instrument of evolution among plants, by the Rev. G. Henslow, who also contributes several instructive papers on plant structure and growth; the strawberry and gooseberry mildews, by Mr. E. S. Salmon, and descriptions of new plants exhibited at the meetings of the Society. Every one concerned with the science or the art of gardening will find in the *Journal* much suggestive and interesting information.

AS a handy compendium of biographical particulars referring to men and women whose names are known in the worlds of literature, art or science, or who are distinguished in other ways, "Who's Who?" now stands alone, for with the 1901 edition, which Messrs. A. and C. Black have just published, is incorporated "Men and Women of the Time." The annual is a good index to the works, recreations and careers of practically every one alive whose influence upon human progress is recognised. All the living Fellows of the Royal Society appear to be included among the biographies, as well as numerous members of other scientific societies. The information tabulated before the biographies includes lists of abbreviations, peculiarly-pronounced proper names, the names and addresses of the chief newspapers and magazines, pseudonyms and pen-names, Fellows of the Royal Society, names, addresses and conditions of admission to scientific and other learned societies, chairs and professors in the universities, university degrees, and other matters of general interest. In the abbreviations we notice "anat.," signifying anatomy or anatomical, and "bot." for botany; but it is not easy to understand why these should be given, while other conventional abridgments, such as "math." for mathematics, "astr." for astronomy, "mech." for mechanics, "mag." for magnetism or magazine, "phys." for physical, "soc." for society," and "phil." for philosophical, are not explained. Either "anat." and "bot." should be omitted or others in just as common use should be inserted. The principle which has led to the selection of other abbreviations is also not clear. We find A.K.C. signifying Associate of King's College, and K.C. for King's College; but we do not see A.R.C.S. for Associate of the Royal College of Science, or U.C. for University College. B. Eng. is given for Bachelor of Engineering, but B.E. is the form usually adopted. D.Sc. is given, but not Sc.D.; and M.I.M.E. (Member of the Institution of Mechanical Engineers) is also omitted, while fellowship of the unrecognised Society of Science and Art is dignified by F.S.Sc.A. In the next edition the professors in the universities of London and Birmingham ought to be added to the list of those occupying chairs in the older universities.

THE additions to the Zoological Society's Gardens during the past week include a Cuvier's Gazelle (*Gazella Cuvieri*) from Algeria, presented by Mr. B. T. Barneby; a Golden Eagle (*Aquila chrysaëtus*) from Scotland, presented by Mr. H. E. Bury; a Rose Hill Parrakeet (*Platycercus eximius*) from Australia, presented by Mrs. Stoughton; a Burmese Tortoise (*Testudo elongata*) from Burmah, presented by Captain A. Pam; a Slow Loris (*Nycticebus tardigradus*) from the Malay Peninsula, three Ring-tailed Coatis (*Nasua rufa*) from South America, a Maximilian Parrot (*Pionus maximiliana*) from Brazil, two Lettered Aracaris (*Pteroglossus inscriptus*) from Para, two Adelaide Parrakeets (*Platycercus adelaidae*), four Plumed Ground Doves (*Geophaps plumifera*) from Australia, two Common Cassowaries (*Casuarius galeatus*) from Ceram, an Ural Owl (*Syrnium uralensis*), a Passerine Owl (*Glaucidium passerinum*), European, five Chestnut-bellied Finches (*Munia rubro-nigra*), six Bungoma River Turtles (*Emyda granosa*), a Roofed Terrapin (*Kachuga tectum*) from India, two Leopard Tortoises (*Testudo pardalis*) from South Africa, a South Albemarle Tortoise (*Testudo vicina*) from South Albemarle Island, three Wrinkled Terrapins (*Chrysemys scripta rugosa*) from the West Indies, a Muhlenberg's Terrapin (*Clemmys muhlenbergi*) from North America, an European Pond Tortoise (*Emys orbicularis*), European, deposited.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY, 1901.

Jan. 2–3. Epoch of the January meteors (Radiant 230° + 53°).
3. 9h. Venus in conjunction with Neptune. Venus 1° 10′ N.
3. 11h. 7m. Minimum of Algol (β Persei).
5. 9h. 45m. to 10h. 50m. Moon occults 1 Cancri (mag. 5·9).
6. 6h. 36m. to 7h. 31m. Moon occults A^1 Cancri, (mag. 5·6).
6. 7h. 56m. Minimum of Algol (β Persei).
6. 13h. 48m. to 15h. 4m. Moon occults 60 Cancri, (mag. 5·7).
9. 4h. 45m. Minimum of Algol (β Persei).
15. 9h. Venus in conjunction with Jupiter. Venus 0° 22′ N.

Jan. 15. Venus. Illuminated portion of disc = 0·902, Mars = 0·949.
17. 21h. Jupiter in conjunction with moon. Jupiter 2° 13′ S.
18. 2h. Venus in conjunction with moon. Venus 2° 12′ S.
18. 16h. Saturn in conjunction with moon. Saturn 2° 41′ S.
19. 18h. 37m. to 21h. 21m. Transit of Jupiter's Sat. III.
24. 8h. Venus in conjunction with Saturn. Venus 0° 20′ S.
28. 8h. 3m. to 8h. 28m. Moon occults 13 Tauri (mag. 5·4).
29. 6h. 0m. to 6h. 37m. Moon occults DM + 20°, 785 (mag. 5·8).
30. 14h. 41m. to 15h. 36m. Moon occults χ^1 Orionis (mag. 4·7).

EPHEMERIS FOR OBSERVATIONS OF EROS.—The following is an abridgment of Herr Millosevich's ephemeris for January :—

Ephemeris for 12h. Berlin Mean Time.

1901.	R.A.	Decl.	Mag.
	h. m. s.	° ′ ″	
Jan. 1	2 3 52·80	+37 55 14·5	
3	9 2·80	37 3 39·5	8·44
5	14 27·17	36 12 7·3	
7	20 4·92	35 20 39·0	8·45
9	25 55·21	34 29 15 8	
11	31 57·23	33 37 59·2	8·45
13	38 10·17	32 46 50·5	
15	44 33·19	31 55 51·2	8·46
17	51 5·61	31 5 3·0	
19	2 57 46·65	30 14 27·1	8·47
21	3 4 35·62	29 24 5·4	
23	11 31·79	28 33 59·3	8·49
25	18 34·34	27 44 10·1	
27	25 42·53	26 54 39·0	8·52
29	32 55·50	26 5 26 8	
31	3 40 12·48	+25 16 34·8	8·55

DIAMETER OF VENUS.—In the *Astronomische Nachrichten* (Bd. 154, No. 3676) Prof. T. J. J. See announces the results of a long series of measurements of the diameter of Venus, made with the filar-micrometer on the 26-inch refractor of the U.S. Naval Observatory at Washington. He also prefaces his remarks by a *résumé* of the observations of the diameter which have been made since the time of Galileo (1620).

The difficulties of the determination are summarised thus :—

(1) The enormous change in the geocentric distance of the planet renders the apparent diameter extremely variable.

(2) The thin line-like horns presented when the planet is near inferior conjunction are easily affected by atmospheric disturbances, rendering bisection with the micrometer wire difficult.

(3) As the crescent enlarges the diameter decreases.

(4) Near superior conjunction, although the disc is nearly round, its diameter is so small, and the time of observation is necessarily such that the heated atmosphere has a great disturbing effect on the definition.

(6) Irradiation, which is always great on account of the brilliancy of the planet.

Much of the difficulty due to the brilliancy has been eliminated by the use of coloured screens between the eye and telescope, as described in *A.N.* Nos. 3636, 3665.

The mean of Prof. See's determinations on 22 days gives a mean diameter of

$$16''\cdot80^{\circ} \pm 0''\cdot022$$

which is in close agreement with the value 16·820 deduced by Dr. Auwers in 1894 from the transits of Venus in 1874 and 1882.

Several suggestions are included comparing the work with heliometer and filar micrometer on planetary diameters, the two giving variable results with different planets.

REDUCTION OF OCCULTATIONS.—M. L. Cruls, director of the Observatory of Rio Janeiro, has published an improved method of time determination from lunar occultations, based on the exact knowledge of the instant of apparent conjunction of the two bodies. The formulæ of Bessel are slightly modified, and both analytical and graphical solutions given at length, with examples of each.

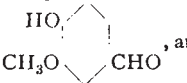
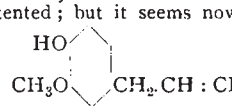
NATURAL AND ARTIFICIAL PERFUMES.

THE passing century has seen the rise and subsequent decay of several great branches of chemical industry. Early in the century, when the chemical methods applicable to the manufacture of alkalis and of alkali products were being actively developed, profits were large, whilst now that the chemical difficulties encountered in the manufacture of alkali have been practically overcome, the financial prosperity of an alkali works depends mainly upon economy in carrying out certain engineering processes ; the science of the chemist is now of rather less importance than the art of the engineer. The younger industry of coal-tar dye-stuff manufacture is similarly, though more gradually, developing into a branch of engineering, and in consequence money is not made so rapidly as was once the case. During the last twenty-five years a new chemical industry, that concerned with artificial perfumes, has made rapid progress and would seem to give more promise of both chemical and financial prosperity than either of its elder sisters. Perfumes are only needed in small quantities, but, in accordance with the law that anything ministering to our pleasures fetches a far higher price than a mere article of utility, profits upon a really gigantic scale may be easily obtained ; again, the enduring chemical prosperity of the new industry is assured in that a constant succession of new perfumes is absolutely necessary ; by the time that improved methods of manufacture and competing processes have lowered the price of a perfume, the material has become unfashionable. No lady would use a cheap perfume. Further, the sense of smell in man is as yet wholly uncultured ; in walking through the country we can rarely identify a particular odour caught until the sight of the plant from which it emanates makes us wonder at our hesitation. The coal-tar colour industry found us provided with a highly-developed system of colour perception, whilst the newly-inaugurated artificial perfume industry has to cultivate a neglected sense probably possessing similar artistic potentialities.

The scientific methods adopted in the new industry consist, in the main, of three : (1) in the extraction of odoriferous compounds from the natural products in which they occur ; (2) in the artificial preparation of naturally occurring odoriferous compounds by synthetic processes ; and (3) in the manufacture of materials possessing odours resembling those of naturally occurring substances of pleasant smell. The odoriferous principle of bitter almond oil was one of the first isolated and subsequently synthesised ; the oil was obtained during the Middle Ages by distilling bitter almonds with water, whilst, nowadays, only very small quantities are prepared from the almond. Apricot kernels are first freed from fatty oils by hydraulic pressure, and then caused to undergo a fermentative process. The kernels contain a glucoside, amygdalin, which, at a suitable temperature, is hydrolysed by an unorganised ferment, emulsin, also present, with formation of benzaldehyde, $C_6H_5.CHO$, hydrogen cyanide and grape sugar, in accordance with the equation

$$C_{20}H_{27}NO_{11} + 2H_2O = C_6H_5.CHO + 2C_6H_{12}O_6 + HCN.$$

The mass is then distilled in a current of steam, and the resulting oil separated from the aqueous distillate and freed from the prussic acid which it still retains. Liebig and Woehler first separated pure benzaldehyde from crude bitter almond oil in 1832. Benzaldehyde is prepared on a large scale by the hydrolysis and oxidation of benzyl chloride by boiling it with cupric or lead chloride solution ; the artificial oil retains with great tenacity traces of benzyl chloride, and the penetrating, unpleasant odour of this impurity renders the product fit only for scenting common soaps and prevents its use in perfumery. Nitrobenzene, $C_6H_5.NO_2$, the highly poisonous so-called oil of mirbane, has an odour very similar to that of benzaldehyde, and is sometimes used in its place.

Vanillin, the odoriferous principle of the vanilla bean, is an aldehyde of the constitution  , and was artificially prepared in 1874 by Tiemann and Haarmann ; the original method of preparation consisted in oxidising coniferin, a glucoside contained in the sap of various coniferæ, with chromic acid. Many different methods of preparing vanillin have been patented ; but it seems now to be mainly obtained from eugenol,  , a phenol contained